Lösungen Übungsaufgaben Differenzialrechnung IV

1.

a) $x_1 = \dfrac{4}{3}\pi + 2k\pi$; $x_2 = \dfrac{5}{3}\pi + 2k\pi$

b) $x_1 = \dfrac{5}{6}\pi + 2k\pi$; $x_2 = \dfrac{7}{6}\pi + 2k\pi$

c) $x_1 = k\pi$; $x_2 = \dfrac{1}{3}\pi + 2k\pi$; $x_3 = \dfrac{5}{3}\pi + 2k\pi$

d) $x = \dfrac{1}{6}\pi + k\pi$

e) $x_1 \approx 0,848$; $x_2 \approx 2,294$

2. Punktsymmetrie zum Ursprung; $x_{0_1} = 0 + k\pi$; $x_{0_2} = \dfrac{\pi}{2} + 2k\pi$; $x_{0_3} = \dfrac{3\pi}{2} + 2k\pi$;

$HP\left(\dfrac{\pi}{4} + 2k\pi \,\middle|\, 2\right)$; $TP\left(-\dfrac{\pi}{4} + 2k\pi \,\middle|\, 2\right)$

3.
a) $p = 4$; $x_0 = 2k$

b) $HP(1 \,|\, 2)$; $TP(3 \,|\, -2)$; $WP_1(0 \,|\, 0)$; $WP_2(2 \,|\, 0)$

4. $HP_1\left(\approx 0,73 \,\middle|\, \approx 4,29\right)$; $HP_2\left(\approx 3,88 \,\middle|\, \approx 2,29\right)$; $TP_1\left(\approx 2,30 \,\middle|\, \approx -3,14\right)$; $TP_2\left(\approx 5,44 \,\middle|\, \approx -1,67\right)$

5. $HP\left((2k+1)\pi \,\middle|\, 3\right)$; $TP\left(2k\pi \,\middle|\, 2\right)$